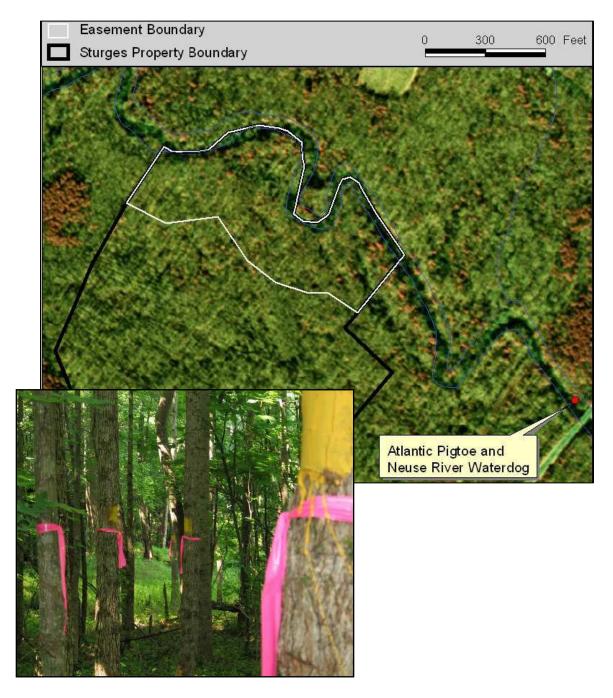
2007 DENR STEWARDSHIP PROGRAM REPORT on EEP PILOT YEAR



May 2008

Executive Summary

The pilot year for the DENR Stewardship Monitoring program ran from September 15, 2006 through September 14, 2007. Of the initial 75 properties transferred from the Ecosystem Enhancement Program (EEP) to DENR's Stewardship program, with an endowment of \$14,000 per property/site for a total of \$1,050,000, 71 properties were monitored during the pilot study period.

North Carolina land trusts provided the conservation easement monitoring during the pilot year. The state's land trusts have partnered with DENR on many conservation efforts over the years, and in fact, facilitated the acquisition of the majority of the EEP conservation easements being monitored. A major component of the land trust's ongoing conservation efforts is stewardship and monitoring of fee title and conservation easements they own or hold easements on. Based on years of monitoring experience, the land trusts bring a wide range of skills and insight to the program, which has contributed since the early stages of developing the program to creating an effective and comprehensive approach.

This report provides a review of stewardship costs and an analysis of program effectiveness, along with recommendations for improvement. Conservation tracts in the pilot study varied in acreage from 3 to 915 acres; properties were sorted into 6 size categories, with each tract category capped for total annual payable costs.

Analysis of the actual costs of stewardship activities revealed some items of concern. Properties less than 100 acres cost the same to monitor as projects up to 250 acres. These properties cost the program \$382. The EEP might want to focus on requiring larger properties in the future to realize the economies of scale. The Stewardship program proposes to create an endowment scale based on the property size (Appendix D).

The interest earned on the \$14,000 per property endowment at the current rate of 4.5% provides \$268 annually for monitoring after consideration for the rate of inflation. Only 15 of the 71 properties were monitored for this fee or less. A minimum of \$22,200 per property endowment would be needed to provide the projected 2007-2008 average annual monitoring cost of \$424 per property. Additional funds would be needed for larger properties (Appendix D). This does not include funds for DENR stewardship staff or operations.

During the pilot year, only monitoring costs were studied. Additional expenses for management of conservation tracts and legal enforcement activities may require additional funding. For instance, if invasive species are not managed on these tracts, the ecological attributes of the preservation sites may not exist in the future. Enforcement or restoration after an easement violation occurs will also create additional expenses. The concern is how to acquire funds to cover such management and enforcement activities.

In order to establish a consistent approach to monitoring of the conservation easements, a program manual was developed and introduced to the land trusts at a training session held at the beginning of the project. There were some inconsistencies in approach due to this being the start up of the program and the fact that each land trust has been monitoring their properties for years and had to adjust their standard procedures to the DENR requirements. This may account in part for the variability in data, discussed later in the Comparison of Land Trust section. Efforts are underway to encourage full and consistent implementation of the procedures.

In summary, the stewardship monitoring process established by DENR is successful. However, the current endowment of \$14,000 per property does not generate sufficient funds. An endowment minimum of \$22,200 is needed per property plus continued staff and operations support from the North Carolina Department of Transportation.

Background

Pilot projects provide an opportunity to understand the process of a new initiative, determine progress, and conduct an evaluation of effectiveness. This report documents the Stewardship Pilot program. DENR staff developed a *DENR Conservation Lands Stewardship Program* manual and met with Conservation Trust for North Carolina (CTNC) and participating land trusts (LTs) in September 2006 to provide training on the implementation of the program. This document describes the Stewardship program's strengths and weaknesses, and then provides recommendations to streamline and improve the new program.

The contract between DENR and the 12 land trusts and CTNC for the Pilot year study was intended to cover stewardship monitoring on 11,426 acres on 75 properties. Seventy-one (71) properties were monitored and four (4) were not. Great Coharie or Coharie (EEP Project Number 82-V), Roanoke River Blue Sky Tract 42-14 (EEP Number 42-P), Roanoke River Blue Sky Tract 42-15 (EEP Number 42-Q), and the Tomlinson Tract (EEP Number 35-AK) had not been acquired through the land trusts or the anniversary of the closing date had not occurred and thus were not monitored. This reduced the total acreage monitored in the Pilot project to 5,574 acres. The CTNC provided technical assistance during the Pilot study.

In 2006/07, EEP transferred \$1,050,000 into an endowment account to earn interest at the State Treasurer's Office. An additional \$81,379 was placed into an operating account that does not earn interest. Payments to the LTs and CTNC were made out of the operating account. Hunting leases on the Great Coharie site generated \$6,433 in income that was applied to the operating account for the monitoring of the Great Coharie site.

Pilot Year Analysis

Each property is unique due to variations in accessibility, topography, complexity of boundary lines, relationship with the landowner, density of vegetation, and adjacent land use practices. These different characteristics result in variability in the number of hours needed to conduct the inspection. From Table 1, Pilot Project Analysis, both the average time and median time increased with the property size.

Table 1: Pilot Project Analysis

		Ave.		Ave.		Total
Project	No. of	Time	Median	Acres/	Ave.	Actual
Size (ac)	Proj.	(hrs)	Time (hrs)	day	Fee (\$)	Cost (\$)
Up to 30	29	7.2	7.5	19	301	8,576
31-60	22	8.4	8.7	38	352	7,754
61-100	7	9.1	10.0	75	384	2,690
101-300	9	14.0	13.5	92	607	5,461
301-1000	4	14.8	15.8	293	677	2,511
1001+	0	NA	NA	NA	NA	NA
TOTAL or AVE	71	9.1	8.8	69	382	27,131

Over 5,500 acres were monitored as part of the Pilot year study at a cost of \$27,131. The average property was 79 acres and took 9 hours. The median property was 36 acres and took 8.8 hours to monitor. The average fee was \$382, but the median fee was \$465. All mileage reimbursements and other expenses are included in the average fees above. The average distance to each property was 47 miles, which cost \$20 per project.

Monitoring of smaller properties (up to 60 acres) had the highest per-acre costs. With the exception of the 301-1000 acre category, the average fee for each category was below the estimates by \$13 to \$152. Only 12 of the 71, or 17% of the projects exceeded the estimates. The largest cost overrun of the estimate was \$327 for a project that encompassed two parcels. High water can significantly increase survey time. An overrun of \$317 occurred on a site that was extensively flooded during the inspection resulting in two days to inspect a property. The next largest overage was \$114 that was also flooded. Seven of the 12 properties exceeding the estimates were for the Tar River Land Conservancy equaling \$630. Four other LTs had one property each exceeding estimates, totaling \$487.

Estimated Time Per Project

While we do not have detailed breakdown of time for each project, a rough estimate of effort exerted in an 8 hour day can be made. Assuming that it takes 30 minutes to retrieve the file and review the Baseline documentation report, one hour in travel, one hour to complete the monitoring report form and download photos, 30 minutes to send a copy of the report to the property owner and file it, one would have five (5) hours for field work for each inspection. These estimates are a guide only and field and travel time are variable based on the site.

For all properties in the Pilot study, on average 69 acres were completed per day. Smaller sites have a higher perimeter to acre ratio. A graph showing a time analysis for all of the properties is presented in Appendix A.

Comparison of Land Trusts

Table 2 compares the different land trusts. Some of the difficulty in comparing the LTs is the small sample size for all but two LTs; the Land Trust for Central NC and Tar River Land Conservancy.

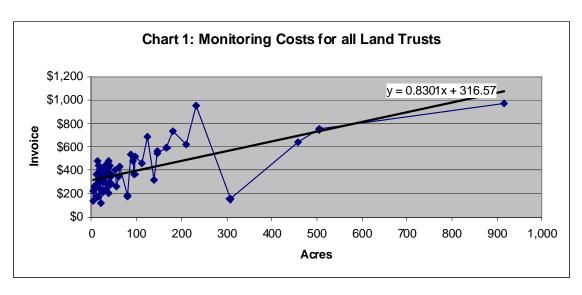
Table 2: Comparison of Land Trusts

		Ave.	Ave.	Total		
	No. of	Size	Acres/	Time	Median	
Land Trust	Projects	(ac)	day	(hrs)	Time (hrs)	Total Paid (\$)
Catawba	1	506	231	17.5	17.5	748
Eno River	1	60	44	11	11	349
Central NC	14	34	51	75	5	3,250
New River	1	95	84	9	9	367
NC Coastal	1	123	62	16	16	685
Pacolet	3	26	25	25	8	1,072
Piedmont	2	301	178	27	13.5	1,227
Sandhills	2	475	217	35	17.5	1,422
S. App.	1	146	97	12	12	561
Tar River	42	52	45	400	9	16,734
Triangle	3	114	166	16.5	3	717
TOTAL or AVE	71	79	69	644	8.8	27,131

There was a learning curve to complete the monitoring and the complexities associated with each site. The LTs with 1-3 properties would not experience an efficiency of effort. However, the Land Trust for Central North Carolina and the Tar River Land Conservancy should have developed a comfort level to monitoring.

A comparison of individual invoices submitted by all LTs is depicted on Chart 1. Two of the 71 invoices differ significantly from the norm. These two outliers are equidistant from the trend line and thus cancel each other out.

Chart 1 includes invoice amounts compared to acreage for all Pilot year properties. The linear curve shows that the non-field related expenses for all properties average \$316. Field expenses add an additional \$83 for every 100 acres.



One may suggest that the trend line in Chart 1 is not linear. However, a polynomial trend line was also attempted (with and without the two outliers). Polynomial lines attempt to recognize the wiggles in the trend. The vast majority of the properties are less than 60 acres; the polynomial and linear curves are almost identical at the lower range. The linear curve was chosen because there was little difference in the two curves.

Other Analyses

Endowment and Interest

Monitoring cost for the Pilot year was \$29,032 (\$27,131 for LTs and \$1,901 for CTNC), which exceeded the \$28,794 in interest earned by the endowment for the year by \$238. In future years, it is anticipated that the annual interest will not keep pace with expenses for management, enforcement and administration, as well as increasing inflation, hourly wages and mileage reimbursement rates.

The size of the endowment payment for each property must be sufficient to cover these anticipated expenses in order for the Stewardship program to be successful. EEP transferred \$14,000 per parcel to the Stewardship program. A key question to be answered through the pilot year results is whether that amount is adequate to cover all stewardship expenses for these properties in perpetuity. The Pilot year results suggest that it is not.

Using the historical interest and inflation rates will assist in predicting how the endowment will grow. This is known as an inflation-protected endowment. The 10-year Treasury note has become the security most frequently quoted when discussing the performance of the U.S. government-bond market and is used to convey the market's take on longer-term macroeconomic expectations.

To calculate the needed endowment, the average fee per project is multiplied by the difference between the rate paid on the 10-year Treasury note and the inflation rate. In the tables below, the Treasury note rate was calculated for the period 2000 through 2006.

Table 3: Estimated Income for \$14,000 Endowment		
treasury rate	4.68%	
inflation rate	2.77%	
difference	1.912%	
Available endowment income	\$267.68	

From Table 3, we observe that the historical interest rate has been 4.68% and the inflation rate has been 2.77%. An amount equal to the inflation rate should be returned to the endowment principle. A \$14,000 endowment would yield \$267.68 in interest for annual monitoring. The cost to monitor the properties averaged \$382. Clearly, interest on the current \$14,000 endowment per property is not sufficient to pay for basic annual monitoring costs.

Taking the average monitoring hours time a \$42 per hour rate and adding travel reimbursements, the 2007-2008 cost for each property is projected to be \$424.00. Using the historical interest and inflation rates (Table 4), we project that each parcel's endowment should be increased to a minimum \$22,200 to cover the monitoring.

Table 4: Endowment Needed Based on Average Invoice Projected for Year 2				
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Average monitoring cost	\$424.00			
treasury rate	4.68%			
inflation rate	2.77%			
difference	1.912%			
Endowment Needed	\$22,175.73			

Violations

The endowment provided by EEP is inadequate to pay for enforcement measures. In fact, it is clear that, at historical interest and inflation rates, the endowment will not cover total stewardship costs. The enforcement of the "violation" at the Wimberley property required significant time to investigate and discuss the concerns with the property owner and the presumed "violator." Additional coordination with the violator to reach resolution is expected to be extensive. The endowment funds were designed to cover site monitoring only. Given the two easement violations encountered during the first year, easement violations could be a significant cost to the program.

Not all properties transferred to the program had the trees blazed and painted or had been posted with signs. It is recommended that blazing and signs should be undertaken at the earliest opportunity. It is important to provide funding to post or repost boundaries on easement properties approximately every five years. These preventative measures should be less costly than resolving a violation.

Natural Disasters

Discussions were held with the N.C. Department of Emergency Management (DEM) regarding potential compensation for damages caused to these sites by natural disasters, such as hurricanes. They recommended that we have photographic evidence of the predisaster condition as a baseline for comparison if a disaster occurred. In instances where culverts are involved, it is imperative that photographs are taken at the inlet and outlet for each culvert on every site inspection in order to receive compensation. This photo documentation will demonstrate that the pipe was open prior to the storm or other natural disaster. Without this documentation, it may be difficult to receive funds to correct damages. In addition, the baseline documentation reports should also discuss the presence of invasive species. All baseline reports must show the lack of the invasive plants to demonstrate "damages" caused by wind events. DEM's *Project Worksheet* forms that are completed and turned into DEM after the disaster should state the potential for invasive seeds blown into the property, which might not germinate until 6 months

later. A field inspection should occur shortly after the anticipated germination period to document the "damages" and request DEM re-imbursements.

Aerial Inspections

Four of the Pilot program sites were not inspected this year due to extenuating circumstances. Arrangements need to be made for a contractor to inspect the Roanoke River Blue Sky Tracts 42-14 and 42-15 in 2007-2008, and TRLC will inspect the Tomlinson Tract. The Great Coharie site will be a difficult and time-consuming property to monitor because the vast 4,000+ acres is remote with few entry points for access. It may be most cost effective to monitor the site via aerial photography or helicopter. Sampson County plans to conduct a leaf-off photo flyover in spring 2008, which may assist in monitoring.

Hunting Leases

The larger state-owned tracts of land with fee ownership should be placed into the game lands program. However, the Great Coharie property is located in a sparsely populated county with three (3) game lands already. Discussions with the County have commenced to determine their interest in managing the property. Until there is a resolution with the County, the hunting leases for this property should continue. This large property also suggests that the size of the endowment should correlate with the property size. The Coharie tract would need approximately 19 days to monitor the site using 0.63 mph along the perimeter. To achieve the \$6,900 needed to monitor this site annually, an endowment of \$361,000 is needed for this property.

Given the size of the endowment for each property for stewardship monitoring and the average cost to monitor each site, all of the interest (and more) will be needed to monitor the properties. Hunting lease payments can potentially offset a small amount of this shortage when and where appropriate. On a case-by-case basis, hunting leases could be considered in conjunction with the existing terms of the conservation easement for fee-simple properties to provide much-needed income to pay for monitoring. Hunting leases issued by EEP and Stewardship program should be consistent in their language and requirements.

Administrative costs

Because the Stewardship Director was not in place for the Pilot year, the study period did not include personnel expenses, thus allowing the endowment to continue to grow. NCDOT is covering the salary and benefits for the Stewardship position for the first two years. The Stewardship program administrative cost for 75% full-time is estimated to be \$57,000 annually over the next 5 years. If there are no additional properties included in the program, the \$57,000 would be spread over 100 properties. The endowment would need to be \$50,500 per parcel to cover the cost of monitoring and salary and operating costs of the Stewardship program.

Conclusions and Recommendations

The size of the initial endowment was \$14,000 per property. Based on the pilot year results, the current funding allocation per site is insufficient to cover the necessary costs associated with easement monitoring. Unless additional funds can be secured, monitoring expenses and/or the frequency of monitoring will have to be reduced, resulting in decreased oversight of the conservation easements and potentially increased easement violations. A total of \$22,200 per parcel is the minimum needed to cover monitoring costs and a total of \$50,500 is needed to also cover administrative costs in order to maintain annual monitoring. The Stewardship balance sheet is presented in Appendix B. For the first two years of the program, NCDOT is providing funding for administration and operating costs. The Stewardship program recommends that this practice be continued through future EEP budgets to avoid the need for a substantial increase in the endowment. The Stewardship program is investigating other ways to increase the endowment and/or minimize costs.

Many of the initial assumptions in establishing the Stewardship program proved to be correct and only minor changes are proposed to the stewardship protocols. During the Pilot year, the LT's were paid on a flat rate basis for each property individually. In an effort to reduce the number of invoices, increase efficiency, and decrease the time needed to approve invoices, lump sum contracts have been offered as a payment option.

As expected, economies-of-scale rules apply to the Pilot year properties. The smaller properties were more time consuming per acre, than larger ones. The ideal property size is approximately 250 acres and located within 20 miles from the LT office. This property could be monitored within an 8-hour day. The EEP should consider 250 acres as the ideal property size.

Permitting the LTs to conduct the year two monitoring within a 9-15 month window from the last monitoring would provide flexibility in monitoring properties in the vicinity on the same day. Adoption of this policy is another option to increase LT efficiency and decrease project costs. Monitoring for year three and beyond should be within 45 days of the second year monitoring anniversary.

The Tar River Land Conservancy spent 44% of their invoiced time in the field and the Land Trust for Central NC spent 50% of their time in the field. Only those two LTs were studied since they have more than 10 sites to monitor. The TRLC is the only entity that requests that the landowner sign the monitoring form. This possibly accounted for the 6% increase of time in the office. The collection of the signature should be discontinued. After monitoring, a letter attached to the monitoring report should be sent to the landowner thanking them for their continued stewardship.

To reduce the liklihood of getting lost or off the property boundary, the monitoring entity should have the shape file loaded into a GPS unit. The Stewardship program should work with the State Property Office to get accurate shape files for each property.

As the program evolves, there are a number of additional items that should be considered. Most properties have their boundaries posted with paint, but do not have signs that identify the boundary of the easement. It is possible that the Wimberley property violation could have been prevented had signs been present. After the inception of the EEP preservation program, a survey template was provided to the land trusts that required property boundaries to be painted with yellow paint. Properties that were surveyed prior to the issuance of the survey template were not posted with yellow paint. There are also additional easement properties that have been posted, but with different colors of paint and/or with land trust signage rather than EEP signage. Completion of the boundary markings should be a priority for next year. Paint should be reapplied every 5-7 years. Funds for this have not been incorporated into the Stewardship program.

The CTNC is querying the LTs to develop a comprehensive list of the status of boundary postings for all EEP easement properties. Just as consultants can use survey grade GPS units for the collection of wetland boundaries for State projects, the LTs could potentially perform the painting of the trees, but this decision has not been finalized.

The TRLC has 50 properties in year 2 monitoring. The combined length of the boundary on these properties is 602,971 feet. If a sign were placed every 100 feet, they would need 6,000 signs. The placement of the sign would take time and each sign would cost approximately \$1.61 each. With the TRLC having 50% of the properties, more than 12,000 signs at \$20,000 would be needed to sign all of these properties. If signs were installed at the Great Coharie site, we add 2,500 signs for all 13,000 acres in the Stewardship program. The Coharie site is a high priority for signage because most of the boundary is located within a forest. The cost for signs for the Coharie site is estimated to be \$4,000 plus labor.

We need to diligently track changes in property ownership, as these can present problems. The Sturges/Dibella property was a clear example of how dealing with a new landowner can cause the monitoring time to increase significantly. The LTs and not the State Property Office are in the best position to track these changes

Restoration sites will be transferred to the Stewardship program in the next year or two. It is important to develop monitoring protocols and an endowment rate for restoration sites. Potential conditions to accept the parcels are proposed in Appendix C.

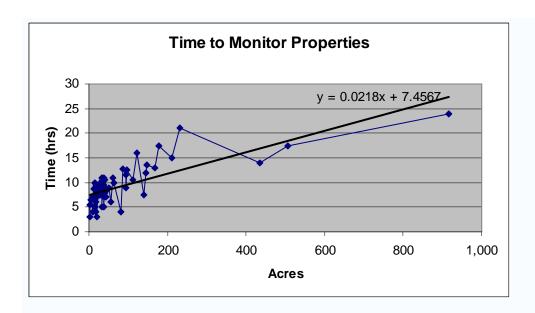
Environmental management for all sites will vary. Some sites may need prescribed burns. A burn policy should be developed, and funding provided.

The Stewardship program had a successful Pilot year. The LTs completed their assignments with minimal oversight but the actual costs (to complete on-site inspections and reports) were higher than expected. When the Stewardship Director accompanied the LT monitor, on-site time charged to the program was approximately half of the time predicted by the LT. To reduce costs, an on-line reporting system was developed which will be evaluated to determine if the time and cost savings are realized.

After two or three visits to a property, we should be able to determine which sites have a higher probability to encounter violations. In future years, only problematic sites may be monitored annually with compliant sites visited every 2-3 years.

Appendix

Appendix A: Time to Monitor Properties



For the four properties that were visited by the stewardship director with the land trusts, the pace in the field was 0.63 miles per hour (3,325 ft/hr). This allowed for backtracking, photographs, tacking signs to trees, and conversation. All properties were in the piedmont. Two properties were easy to navigate with little shrubby undergrowth. One property was in the piedmont with a few steep slopes to navigate. The fourth property was relatively flat and one area had dense pine undergrowth. The landowner was not present for any site visit.

Monitoring the perimeter of sixty (60) acres can usually be covered during 3 hours in the field. Each of the acreage categories were evaluated to determine the property size that could be monitored in a day. The land trusts were able to monitor 250 acres per day when the land category was between 101 and 300 acres. Properties adjacent to or in the vicinity of conservation easements could require less time to monitor that an "isolated" easement.

To complete a project in 8 hours, it is estimated that 5 hours would be spent in the field. Traveling 3,325 ft/hr (0.63 mi/h), one could cover 16,625 feet during the 5 hours; the perimeter of a 396 acre property. According to the trend line equation in the graph, *Time to Monitor Properties* above, a 49 acre parcel could be completed in 8 hours. This low number is probably the result of setting photo points, getting oriented on the property, unexpected circumstances on the ground, and a steep learning curve. Subsequent visits should take less time to cover the same ground.

Appendix B: Comparison of Stewardship Funds Needed Based on Monitoring Frequency

The Stewardship budget for 2007-08 is presented in the table below. The interest income earned by the endowment would fall short by \$63,170. The Internal Revenue Service (IRS) recommends that Stewardship monitoring should be an annual activity. However, the income from the endowment cannot sustain this level. Monitoring of the parcel should occur near the anniversary of the State Property Office (SPO) closing date. Some properties had threats that would require annual monitoring but others could probably receive inspections every 2-3 years. For two years, NCDOT is funding the salary and benefits for the program as a cost savings. The salary and benefits have been included to project the total costs to the program. DENR will ask that NCDOT continue to fund the position beyond the initial two years.

Stewardship Balance Sheet (Dec 2007)		monitor annually	monitor every 2 years	monitor every 3 years
INCOME		,	•	•
interest on endowment 6 months (July- Dec)		\$30,084	\$30,084	\$30,084
\$280,000 batch 3 transfer from EEP in Dendowment increases 23.5%				
expect monthly interest at \$640 interest on endowment 6 months (Jan-Ju	,	<u>\$38,772</u>	<u>\$38,772</u>	\$38,772
	TOTAL INCOME	\$68,856	\$68,856	\$68,856
EXPENSES				
monitoring contracts		\$40,686	\$20,343	\$13,562
transfer to endowment for inflation		\$40,755	\$40,755	\$40,755
20% signage replaced every year		\$9,366	\$9,366	\$9,366
travel		\$780	\$780	\$780
supplies		\$80	\$80	\$80
salary and health benefits		<u>\$40,360</u>	<u>\$40,360</u>	<u>\$40,360</u>
	TOTAL EXPENSES	\$132,026	\$111,683	\$104,902
	BALANCE	-\$63,170	-\$42,827	-\$36,046

Appendix C: Recommended Criteria to Accept EEP Properties

Because the Stewardship income is not sustaining the program, additional management responsibilities should be carefully considered. Monies for management have not been

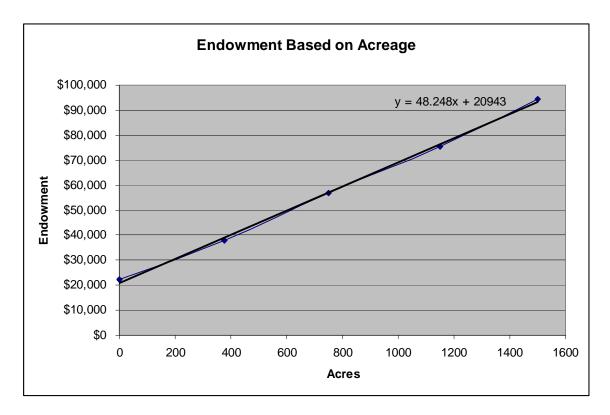
provided. Thus, recommended criteria of sites presented to the Stewardship program should be:

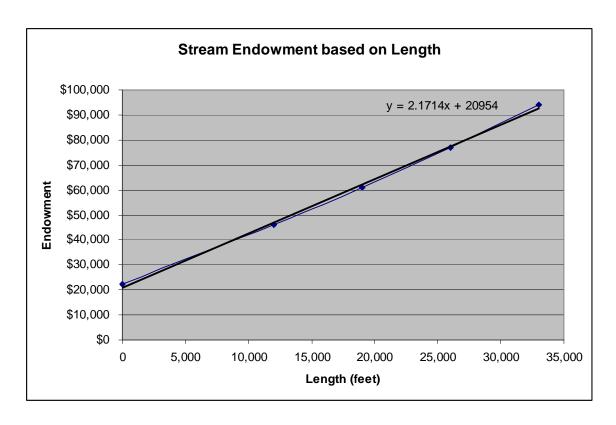
- 1. In compliance with deed restrictions,
- 2. Stewardship endowment as per rates established in Appendix D,
- 3. Signed adequately,
- 4. Free of exotic and invasive species,
- 5. Have a baseline monitoring report with established photo points, and
- 6. Consistent hunting leases between EEP and Stewardship program, if applicable.

Appendix D: Stewardship Endowment Rates

The linear equation line for the time analysis for all properties (Appendix A) is y=0.0218x+7.4567, where y is the time and x is acreage. The acreage category below is based on an 8-hour day, the hourly rate is \$42, and travel is 50 miles round-trip. Thus, the proposed Stewardship endowment categories are:

<u>Acreage</u>	Endowment	Number of Projects*
1-25	\$22,200	33
26-375	\$38,000	63
376-750	\$56,700	3
751-1,150	\$75,500	1
1,151-1,500	\$94,500	0





Stream Length (ft)	Endowment
1-5,000	\$22,200
5,001-12,000	\$46,000
12,001-19,000	\$61,000
19,001-26,000	\$77,000
26,001-33,000	\$94,000

^{*} Includes all parcels transferred as of December 2007.

Stream length and acreage (perimeter) is based on monitoring at 0.63 miles per hour and assuming 5 hours in the field, one hour for the BDR review and 2 hours post field work.